49 pts

Lewis Structures

1. (3 pts) What are valence electrons? How do you tell how many valence electrons an atom has? How many valence electrons do atoms want to have?

- outer most e^-
- by what group an atom is in
- 8 vale$^-$

2. (2 pts) Explain what the "duet" and "octet" rules are and how they are used to describe the arrangement of electrons in a molecule.

duet - only need 2 e^-s to be happy
octet - " " 8 " " "

S + P, -, - - -

3. (3 pts) How many electrons are involved in a single bond?, a double bond?, a triple bond?

single C—C (2)
C=C (4)
C≡C (6)

4. (6 pts) How do you determine how many bonds an atom will want to have? Give at least 4 examples, including the Lewis Dot for the atom and number of bonds.

by the number of FREE e^-'s

Li· 1-bond
·Se· 2-bonds
·N· 3-bonds
·B· 3-bonds

5. (4 pts) Why are electrons placed as far apart as possible in Be? Why are placed the way are in O?

repel each other

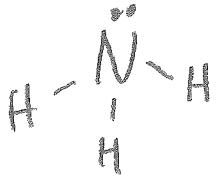
·Be·

·Ö· 1L, 1L 1 1

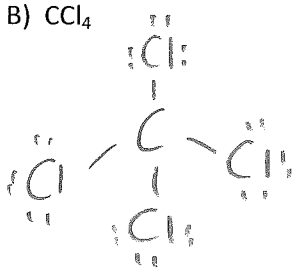
follows the S+P.

6. (32 pts) Draw Lewis Structures for all of the following compounds/ions in which the central atom follows the octet rule. Show all shared and unshared electrons.

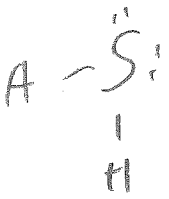
A) NH_3



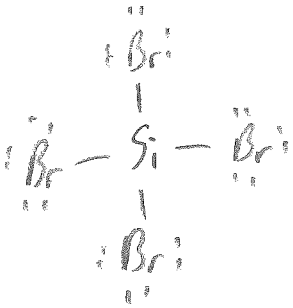
B) CCl_4



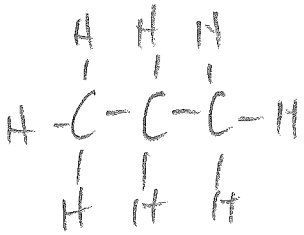
C) H_2S



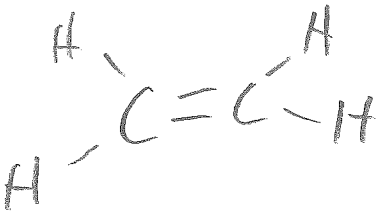
D) $SiBr_4$



E) C_3H_8

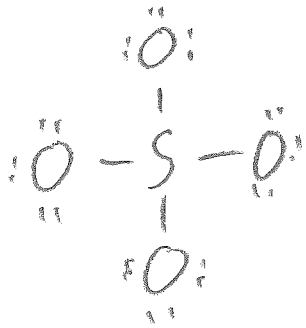


F) C_2H_4



G) SO_4^{2-}

$6+24+2=32$



H) PO_4^{3-}

$5+24+3=32$